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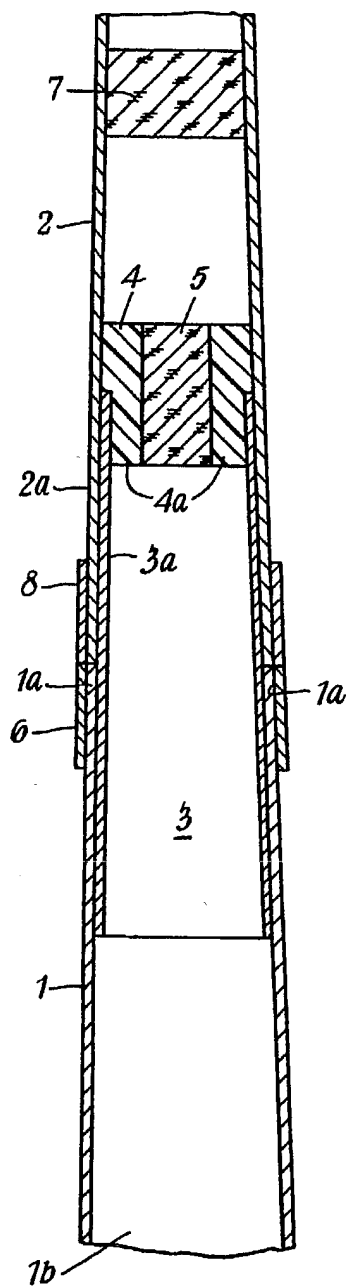


FIG. 1

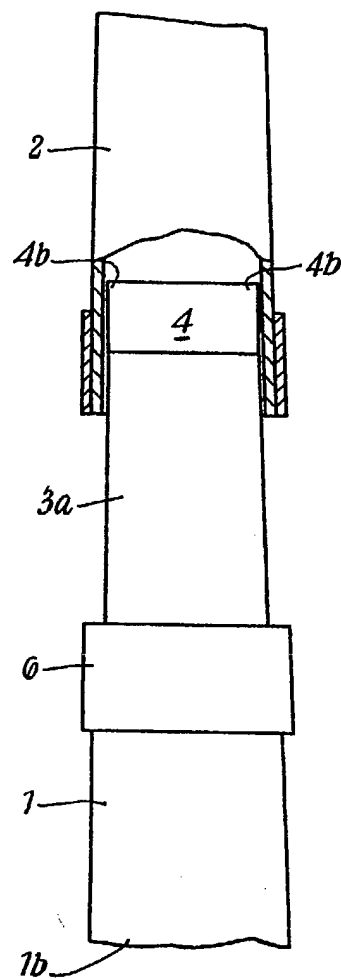


FIG. 2

# PATENT SPECIFICATION

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1,078,254



Inventor: PETER HOYLE.

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## COMPLETE SPECIFICATION

### DRAWINGS ATTACHED

#### Improvements in or relating to the Jointing of Hollow Tapered Rods

We, HARDY BROTHERS (ALNWICK) LIMITED, of Willowburn, Alnwick, Alnwick, a British Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to the jointing of tapered hollow rods, particularly to hollow steel or fibreglass rods such as are used for fishing rods, and similar purposes.

Where a fishing rod is made in several parts, these are frequently joined by the use of a so-called suction joint, which incorporates a plug on the end of one part fitting into a blind socket on the adjacent end of the next part, the plug and socket normally being cylindrical and parallel sided, and having an interference fit susceptible to assembly and separation by hand.

This invention aims to provide a hollow tapered rod constructed in at least two parts which parts are removably connected together by an improved means of jointing.

According to the present invention there is provided a hollow rod having continuous internal and external tapers in the same sense and in the direction of its longitudinal axis and including at least one joint in which two parts to be joined comprise end portions intending to abut together to maintain the continuous internal and external tapers, wherein at the, or any joint, the widest rod part is provided with an insert member having a continuous external taper in the direction of its longitudinal axis which taper is complementary to the internal taper across the two end portions of the hollow rod at the joint so that the narrow end of the insert member can be passed into the widest end of the rod and the member passed along the rod and forced into

wedge engagement with the complementary internal taper of the end portion of the wider of the two parts of the rod at the joint, to form a tapered spigot which projects from the narrow end thereof so that when the tapered spigot is inserted into the wider end of the internal taper in the other part of the joint which forms a socket the two parts are held together by frictional forces developed between the tapered spigot and the socket.

Preferably the narrow end of the insert member is provided with an axially extending plug member of resilient material securely attached to it so that when the tapered spigot is inserted into the wider end of the internal taper in the other part of the joint which forms a socket the two parts are held together by frictional forces developed both between the tapered spigot and the socket and by compression of the plug member in the socket.

If necessary the insert member can be additionally secured in wedge engagement with the complementary internal taper of the end portion of the wider part of the rod by a suitable adhesive. Either or both end portions of the hollow rod at the joint can be reinforced by an external band or binding to prevent the relative portion from splitting when the insert member is driven home into position and/or the joint is assembled.

The present invention will now be described, by way of example only in relation to an embodiment applicable to the joining of two parts of a fishing rod, and with reference to the accompanying diagrammatic drawings in which:—

Fig. 1 shows an axial section through the two rod parts at the joint when assembled together; and

Fig. 2 shows an elevation in part section of the same two rod parts in juxtaposition

before assembly of the joint has been completed.

For ease of illustration the drawings are on an enlarged scale, and the extent of the taper has been exaggerated.

Referring to the drawings, the assembled fishing rod of the embodiment is made in two parts from the two lengths of thin-walled hollow fibreglass tubing which when placed end to end and butt jointed, provide a hollow rod having continuous internal and external tapers in the same sense and in the direction of the longitudinal axis of the rod.

The widest rod part 1 carries within its narrow end portion 1a an insert member 3 which can conveniently be made of aluminium tubing. The insert member 3 has an external taper which is complementary to the internal taper across the two end portions of the hollow rod at the joint. The insert member 3 has a part 3a which projects from the narrow end portion 1a of the part 1 to form a tapered spigot.

The insert member 3 is placed in position by passing it into the widest end 1b of the part 1 and pushing it through the narrow end portion 1a until it jams tightly in position as illustrated where it may, if desired, be additionally secured by a suitable adhesive.

In this embodiment the narrow end portion 1a of the part 1 is reinforced by an external binding 6 which surrounds and prevents this end from splitting when the insert member 3 is firmly located in the part 1.

The narrow end of the insert member 3 carries an axially extending plug member in the form of a shouldered bush 4 which can conveniently be made of nylon or other suitable resilient material. The bush 4 is in the form of a parallel cylindrical member having a shouldered portion 4a adapted to be fitted within the narrow end of the insert member 3. The bush 4 is provided with a bore which is filled with a plug 5 made from cork.

Preferably the external diameter of the wider part of the bush 4 is equal to the external diameter of the spigot 3 at its narrow end.

The narrower part 2 of the rod has its internal taper at its wider end portion 2a complementary to the external taper of the spigot provided by the insert member 3 where the latter projects from the part 1 and so provides a socket for the spigot. The part 2 can be provided with an internal plug 7 of cork to prevent water from entering the rod.

The wider end portion 2a of the part 2 is reinforced against splitting, when the joint is assembled, by an external band 8.

Referring particularly to Fig. 2, it will be seen that when assembling the parts 1 and

2 together, the upper periphery of the bush 4 will be the first part to make contact with the inner walls of the part 2 because the bush 4 is parallel sided and is not complementary tapered like the spigot.

Since the bush 4 is made of a material which is slightly compressible it will start to bind within the part 2 before the external tapered surface of the spigot comes into contact with the complementary internal taper of the socket formed in the part 2. When the parts 1 and 2 of the rod are joined together, as in Fig. 1, the upper end of the bush 4 will be compressed so that its outer wall is tapered into conformity with the inner wall of part 2, thus aiding the security of the joint.

#### WHAT WE CLAIM IS:—

1. A hollow rod having continuous internal and external tapers in the same sense and in the direction of its longitudinal axis and including at least one joint in which the two parts to be joined comprise end portions intended to abut together to maintain the continuous internal and external tapers, wherein at the, or any joint, the widest rod part is provided with an insert member having a continuous external taper in the direction of its longitudinal axis which taper is complementary to the internal taper across the two end portions of the hollow rod at the joint so that the narrow end of the insert member can be passed into the widest end of the rod and the member passed along the rod and forced into wedge engagement with the complementary internal taper of the end portion of the wider of the two parts of the rod at the joint, to form a tapered spigot which projects from the narrow end thereof so that when the tapered spigot is inserted into the wider end of the internal taper in the other part of the joint which forms a socket the two parts are held together by frictional forces developed between the tapered spigot and the socket.

2. A hollow rod as claimed in claim 1 wherein the narrow end of the insert member is provided with an axially extending plug member of resilient material securely attached to it so that when the tapered spigot is inserted into the wider end of the internal taper in the other part of the joint which forms a socket the two parts are held together by frictional forces developed both between the tapered spigot and the socket and by compression of the plug member in the socket.

3. A hollow rod as claimed in either claim 1 or claim 2 wherein the internal tapered surface is circular in a cross section taken perpendicular to the longitudinal axis and the insert member is of frusto-conical shape.

4. A hollow rod as claimed in either claim 2 or claim 3 when dependent on claim

- 2 wherein the plug member is parallel sided and so arranged that the parallel sides are parallel to the longitudinal axis of the insert member.
- 5 5. A hollow rod as claimed in claim 4 when dependent on claim 3 and claim 2 wherein the plug member is cylindrical and is of a diameter equal to the diameter of the narrow end of the insert member from 10 which it extends.
6. A hollow rod as claimed in any one of the claims 2 to 5 wherein the plug member is provided by a nylon bush having an axial bore which bore is filled with cork.
- 15 7. A hollow rod as claimed in any one of the preceding claims wherein either or both end portions of the hollow rod at the joint is or are reinforced by an external band or binding.
8. A hollow rod as claimed in any one of 20 the preceding claims wherein the insert member is secured in wedge engagement with the complementary internal taper of the end portion of the wider part of the rod by a suitable adhesive.
- 25 9. A hollow jointed fishing rod according to any one of the preceding claims wherein the rod parts are made of steel or fibreglass.
10. The hollow rod substantially as 30 herein described with reference to the accompanying diagrammatic drawings.

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